Self-sterility.—EAST and PARK[3] have recently published the results of some extensive experiments on 4 self-sterile species of *Nicotiana*, and have proposed an explanation. In the past there have been several attempts to interpret self-sterility as a response to environmental factors, notably humidity. Such interpretations may have been quite true in some cases of self-sterility, where only a single race of plants has been involved, but highly unsatisfactory in explaining cases where pollen fails on own stigmas and functions on stigmas of another race. It is such a situation that the authors have dealt with, and they have shown conclusively for their material that self-sterility is inherited. Normal seasonal changes at times induced "pseudo self-fertility" in their self-sterile races, but "other environmental factors appeared to have little or no influence on self-fertility."

As to the physiological nature of self-sterility, the authors state that it is involved with rate of pollen tube growth. This in itself suggests that self-sterility behaves as a sporophytic character. The fact is more definitely demonstrated, however, "by the behavior of reciprocal matings, pairs of reciprocals always giving like results either when fertile or sterile."

Going further, the authors state "that modern discoveries tend more and more to show that the sole function of the gametophyte of the angiosperms is to produce sporophytes. The characters which they possess appear to be wholly sporophytic, the factors which they carry functioning only *after* fertilization." This statement seems directed at such theories as that of BELLING, who has given us a striking explanation of "semi-sterility" in beans, on the basis of the direct influence of the germinal equipment of gametophytes upon the gametophytes themselves. It is quite probable, however, that the two cases are involved with distinctly different phenomena, since BELLING'S material showed degeneration and sometimes complete abortion in pollen and embryo sacs, while the Nicotianas of EAST and PARK were self-sterile merely because of the failure of pollen tubes. The hereditary mechanism of the two cases must be quite different.

To explain the hereditary behavior of their Nicotianas, the authors have assumed a mechanism involving multiple allelomorphs and crossing over. If two plants differ in but one of a number of effective factors, they are fertile in intercrosses. "Intrasterile classes" are composed of individuals which differ in none of the effective factors. Anything like a thorough appreciation of this theory can be obtained only from the original article.

This explanation seems sufficiently accurate in interpreting the results of the authors, as well as the results of some of the earlier investigators. From a practical point of view, however, it seems rather unsatisfactory, since it considers only the behavior of self-sterile plants when bred *inter se*. The authors

[3] EAST, E. M., and PARK, J. B., Studies on self-sterility. I. The behavior of self-sterile plants. Genetics 2:525–609. 1917.

state that "all questions connected with the relation between true self-fertility and self-sterility have been omitted designedly as pertaining to a distinct problem." Are we unreasonable in asking for a single theory to explain both self-fertility and self-sterility? Are we wrong in thinking that the significance of self-sterility lies in its relation to self-fertility? Such a general theory, no doubt, will be provided by the authors in their later reports; the present publication evidently represents merely the first of a series on the general subject of self-sterility.

The explanation also has another theoretical shortcoming, similar to that which applied to EAST's "heterozygosis." In heterozygosis EAST stated that hybrids are vigorous because of their heterozygous sets. This virtually amounted to saying that hybrids are vigorous because they are hybrids. "Heterozygosis" was a more accurate and scientific statement of the fact of hybrid vigor, but it was not an explanation. Now EAST states that pollen will not function on stigmas of a plant of which the germinal constitution is the same as that of the plant which produced the pollen. Couched in a terminology involving multiple allelomorphs and crossing over, this may well be a more accurate and scientific statement of the facts of self-sterility and its behavior in inheritance, but it is not an explanation. Such scientific restatements are very valuable in helping to organize facts, and "heterozygosis" unquestionably had such a value. The present theory, however, seems at first sight a much less valuable one, since it is so elastic as to be confusing.

But whether the theoretical argument of the authors is destined to stand or fall, they have done an exemplary piece of research. This seems to have been the first satisfactory experimental attack upon the problem of self-sterility, and the resulting data are therefore extremely valuable.—MERLE C. COULTER.

Buffer processes in succulents.—JENNY HEMPEL[4] has made a very important addition to our rather limited knowledge of actual reaction in plants. Succulents were used in this work, since, with their well known wide and rapid variations in acid content, they might be expected to supply especially interesting material for such a study. Determinations by the use of the hydrogen electrode were made on the juices of numerous specimens of the plants studied, after they had been exposed to varying conditions. The values found range from $P_H=3.9$ to $P_H=5.7$. Higher acidity than the more acid of these values is recorded in the same work in lemon juice ($P_H=2.19$); and by HAAS[5] in citrus fruits ($P_H=2.22$–3.8), in cranberries ($P_H=2.4$), and by a less exact method[6] in the petals of certain flowers ($P_H=$ about 3).

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[4] HEMPEL, JENNY, Buffer processes in the metabolism of succulent plants. Compt. Rend. Trav. Lab. Carlsberg **13**:1–129. 1917.

[5] HAAS, A. R. The reaction of plant protoplasm. BOT. GAZ. **63**:232–235. 1917.

[6] ———, The acidity of plant cells as shown by natural indicators. Jour. Biol. Chem. **27**:233–241. 1916.